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AIC-321
Supplement 4

SEMIANNUAL LIST OF PUBLICATIONS AND PATENTS WITH ABSTRACTS

Western Regional Research Laboratory
Albany 6, California

JANUARY 1 TO JUNE 30, 1953

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ANALYTICAL AND PHYSICAL
ENZYMES
FIELD CROPS--Alfalfa, Rice, Sugar Beets, Wheat
FRUIT AND PECTIN
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FRUIT AND VEGETABLE CHEMISTRY LABORATORY, Pasadena, Calif.

A previous supplement in this series (AIC-321, Supplement 2), included lists for all units of the Bureau of Agricultural and Industrial Chemistry in the Western Region. That supplement is available on request, as are earlier supplements. This supplement, like Supplements 2 and 3, also includes abstracts of publications and patents for all Western Regional units of the Bureau.

Publications with AIC preceding their numbers (for example AIC-356) are mimeographed, and supplies are maintained for free distribution. A limited number of reprints of journal articles are available, usually for a short period following publication. The asterisk (*) before a title indicates that the supply of reprints of that publication was exhausted at the time this list was prepared. Photostat copies can be purchased at nominal cost through the Library of the United States Department of Agriculture, Washington 25, D. C.

All patents are assigned to the U. S. Government. Patents can be obtained only by purchase from the United States Patent Office, Washington, D. C., for 25 cents each.

Bureau of Agricultural and Industrial Chemistry
Agricultural Research Administration
UNITED STATES DEPARTMENT OF AGRICULTURE

OTHER LISTS

Lists of publications and patents with abstracts (similar to this one) from other regional laboratories of the Bureau of Agricultural and Industrial Chemistry are available on request. Inquiries can be directed to Information Division, Bureau of Agricultural and Industrial Chemistry, Washington 25, D.C., or to:

Eastern Regional Research Laboratory
Chestnut Hill Station, Philadelphia 18, Pa.

Northern Regional Research Laboratory
825 North University St., Peoria 5, Ill.

Southern Regional Research Laboratory,
2100 Robert E. Lee Blvd., New Orleans 19, La.

ANALYTICAL AND PHYSICAL

(Analytical papers related to specific commodity subjects are listed elsewhere in this supplement.)

REMOVAL AND RECOVERY OF TRACES OF ETHYLENE IN AIR BY SILICA GEL. F. Stitt and Y. Tomimatsu, Analyt. Chem. 25(1):181-83, Jan. 1953. Experiments with commercial silica gel and a sample containing 5 parts ethylene per million of commercial tank oxygen showed that all the ethylene was adsorbed by the silica gel at -78°C. and released at 150°C. Oxidizable impurities in the oxygen were adsorbed at -78°C. and not completely released at 150°C. Pretreatment of silica gel is required to remove small amounts of oxidizable impurities.

INVESTIGATION OF PROTON MAGNETIC RESONANCE LINE WIDTH OF SORBED WATER. T. M. Shaw and R. H. Elsken, Jour. Chem. Phys. 21(3):565-66, March 1953. Measurements are reported which show that the proton magnetic absorption of the water in hygroscopic materials is significantly different from that of normal water. A correlation is established between the width of the proton absorption line and the heat of vaporization of sorbed water.

REPORT ON SUGARS IN PLANTS. K. T. Williams and E. F. Potter, Jour. Assoc. Offic. Agr. Chem. 36(2):401-4, May 1953. A collaborative study of the ion-exchange resin and lead-acetate clarification procedures showed the resins to be more effective than the lead acetate for removal of non-sugar reducing substances in the analysis of plant materials for sugar.

PREPARATION OF AROMATIC ALDEHYDES. Patent No. 2,628,256 to T. W. Campbell and G. M. Coppinger, Feb. 10, 1953. An aromatic methyl halide (benzyl chloride, o-chlorobenzyl chloride, etc.) is reacted with an alkali metal salt of an organic hydroperoxide, whereby the methyl halide radical is oxidized to an aldehyde radical (-CHO). A feature of the reaction is that side-chain radicals other than the methyl halide radical are not affected and thus are still present in the aldehyde product.

ENZYMES

(See AIC-321, Supplements 2 and 3, for earlier publications of the Enzyme Research Division, which was discontinued in 1951.)

EVIDENCE FOR THE PURITY OF SCHARDINGER DEXTRINOGENASE. S. Schwimmer, Arch. Biochem. and Biophys. 43(1):108-17, March 1953. The engyme in the bacterial culture fluid from B. macerans that is responsible for the formation of Schardinger dextrin from starch has recently been purified to a considerable extent. The present paper records a series of observations related to the extent of enzymic and chemical homogeneity of these purified preparations of Schardinger dextrinogenase.

COLUMN PROCEDURES FOR THE SALT FRACTIONATION OF ENZYME PREPARATIONS. S. Schwimmer, Nature 171(4349):442-43, March, 1953. Two procedures for fractionating enzyme preparations on a column, somewhat different from the previously described chromatopile, are described.

*COMBINATION OF DIISOPROPYL FLUOROPHOSPHATE-INHIBITED TRYPSIN WITH TRYPSIN INHIBITORS (abstract). E. F. Jansen, R. Jang, and H. S. Olcott, Fed. Proc. 12(1):225, Pt. I, March 1953. DFP-inhibited trypsin apparently combined with several trypsin inhibitors (ovomucoid, soybean, lima bean, pancreas, colostrum) but combinations were weaker than those with the active enzyme. A crystalline substance resulting from combination of DFP-inhibited trypsin with crystalline soybean inhibitor was investigated.

FIELD CROPS--Alfalfa, Rice, Sugar Beets, Wheat

Alfalfa

REPORT ON TECHNICAL ALFALFA CONFERENCE, WESTERN REGIONAL RESEARCH LABORATORY, APRIL 1953, mimeographed, 26 pages. Summaries of discussions at a conference sponsored jointly by the American Dehydrators Association and the Bureau of Agricultural and Industrial Chemistry are included. Subjects are "Xanthophylls in Poultry Feed--Alfalfa as a Source," H. R. Halloran; "Alfalfa in Poultry Rations," H. J. Almquist; "Alfalfa in Swine and Cattle Rations," L. E. Card; "Composition of Alfalfa," W. D. Maclay; "Carotene Determination," C. R. Thompson; "Field Harvesting," R. E. Bert, "The Dehydrator," V. C. Britton; "Oiling Alfalfa Meal," G. R. Van Atta; "Pelleting Alfalfa Meal," A. Alessio. Three speakers (Maclay, Thompson, and Van Atta) discussed work of the Western Regional Research Laboratory.

Rice

A NOTE ON THE SUGARS IN RICE. K. T. Williams and A. Bevenue, Cereal Chem. 30(3):267-69, May 1953. The sugars in brown, white, and parboiled rices are fructose, glucose, raffinose, and sucrose. The principal sugar is sucrose. The evidence suggests that parboiling causes the sugars to migrate from the bran layer into the rice grain.

PROCESS FOR CANNING WHITE RICE. R. L. Roberts, D. F. Houston, and E. B. Kester, Food Technol. 7(2):72-80, Feb. 1953. A new process for canned white rice includes boiling until moisture content is about 55 percent, canning under vacuum, and retorting. Mushiness is avoided, and white color and rice flavor are retained.

RICE RESEARCH--WESTERN REGIONAL RESEARCH LABORATORY. The Rice Annual, 1953, published by the Rice Journal, New Orleans, La. Includes a discussion of rice research techniques and summaries of progress in projects on stability of processed rice, storage of rough rice, new rice products, waxy rice flour.

Sugar Beets

*SUGAR BEET PROJECTS AT THE WESTERN REGIONAL RESEARCH LABORATORY. W. D. Maclay and H. S. Owens, The California Sugar Beet, 40, 41, 43, 1952. In cooperation with growers' and processors' organizations, the Bureau of Agricultural and Industrial Chemistry is conducting an extensive program of research on sugar-beet processing at the Western Regional Research Laboratory. The Laboratory is also supervising several contracts on processing problems.

AMINO ACIDS CONTENT OF SUGAR BEET PROCESSING JUICES. A. E. Goodban, J. B. Stark, and H. S. Owens, Jour. Agr. and Food Chem. 1(3):261-64, April 1953. The amino acids in sugar beets are included in the so-called "harmful" nitrogen that is a factor in the formation of molasses in the production of beet sugar. Paper chromatography has been used to identify the amino acids in beet juices. The reflectance density of the amino acid spots developed with ninhydrin was used for quantitative estimation of the 12 amino acids found in beets.

BEET SUGARS, ACID INSOLUBLE CONSTITUENTS IN SELECTED SAMPLES. H. G. Walker and H. S. Owens, Jour. Agr. and Food Chem. 1(6):450-53, June 1953. Reports the presence in sugar beet floc of fat and various adsorbed colloidal impurities from the refined sugar, in addition to saponin and its derivatives. Paper chromatography and ionophoresis were found to be useful supplementary tools for investigating the minute amounts of floc.

COMPOSITION OF CERTAIN BEET DIFFUSION JUICES FROM THE 1950 CAMPAIGN. J. B. Stark, A. E. Goodban, and H. S. Owens, Proc. Amer. Soc. Sugar Beet Technol. 1952, pp. 688-91. Analyses of sugar beet diffusion juices from nine factories are presented. Variations among most of the constituents were many fold, but beet juices from the Rocky Mountain States and Michigan were low in nitrogen as compared with those obtained from Minnesota and along the Pacific Coast.

Wheat

STUDIES ON THE RELATION OF THE PENTOSANS EXTRACTED BY MILD ACID TREATMENT TO MILLING PROPERTIES OF PACIFIC NORTHWEST WHEAT VARIETIES. A. H. Elder, T. M. Lubisich, and D. K. Mecham, Cereal Chem. 30(2):103-11, March 1953. Significant correlations are reported between amounts of pentosan removed from samples of ground whole wheat and milling score for 39 samples. This work is directed toward a method for identification by wheat breeders of good or poor milling quality in small samples.

HEAT DENATURATION OF GLUTEN. J. W. Pence, A. Mohammad, and D. K. Mecham. Cereal Chem. 30(2):115-26, March 1953. Effects of time, temperature, moisture content, pH, and salt concentration on denaturation of gluten by heat have been studied. The denaturation of wet gum gluten was found to be essentially a first-order reaction having an energy of activation of approximately 35,000 calories per mole when measured by a baking-test method and 44,000 calories by a solubility method.

PANARY FERMENTATION--CURRENT STATUS OF PROBLEMS. J. W. Pence, Jour. Agr. and Food Chem. 1(2):157-61, April 1953. A review of recent developments with respect to fermentation in the production of yeast-leavened baked goods, with special attention to fungal enzymes and other agents as dough conditioners and their relation to baking behavior of flours.

OCCURRENCE OF TWO SIMILAR HOMOLOGOUS SERIES OF OLIGOSACCHARIDES IN WHEAT FLOUD AND WHEAT. L. M. White and G. E. Secor, Arch. Biochem. and Biophys. 43(1):60-66, March 1953. Contains chromatographic evidence for the existence of the two similar homologous series of oligosaccharides in wheat flour and wheat, and relates certain of them to the oligosaccharides synthesized during partial inversion of sucrose by invertase.

CHROMATOGRAPHIC EVIDENCE FOR THE OCCURRENCE OF A FRUCTOSYL RAFFINOSE IN WHEAT FLOUR AND WHEAT. L. M. White and G. E. Secor, Arch. Biochem. and Biophys. 44(1):244-45, May 1953. Chromatographic studies showed the presence of a raffinose-like tetra saccharide in alcoholic extracts of wheat flour and wheat. The chromatographic properties and hydrolytic products indicate that it is a fructosyl-raffinose. The same or a similar saccharide was synthesized by the action of a commercial invertase preparation on raffinose and sucrose.

FRUIT AND PECTIN

AIC-353, STUDIES ON REMOVAL OF THRIPS FROM CANEBERRIES INTENDED FOR PROCESSING. J. E. Brekke, C. C. Nimmo, H. A. Swenson, C. E. Samuels, and J. R. Brock (with Oregon Agricultural Experiment Station, Corvallis) Feb. 1953, mimeographed, 5 pages. A progress report on studies conducted during the 1952 season in Oregon to determine the effectiveness of various combinations of dry and wet methods for removing thrips from harvested black and red raspberries intended for canning or freezing. (Reprinted in Canning Trade, 95(52):7-8, July 1953.)

EFFECT OF GROWING AREA ON TANNIN AND ITS RELATION TO ASTRINGENCY IN FROZEN ELBERTA PEACHES. D. G. Guadagni and C. C. Nimmo, Food Technol. 7(2):59-61, Feb. 1953. The tannin content of Elberta peaches from three different growing areas, of varying prevailing climatic conditions, was determined. Differences in relative astringency were directly related to differences in the tannin content of fruit from the various areas.

WRRL DEVELOPS TECHNIQUES FOR MAKING PUFFED POWDER FROM JUICE. S. I. Strashun and W. F. Talburt, Food Engin. 25(3):59-60, March 1953. Vacuum drying procedures have been developed for producing low-moisture powders from orange, lemon, grapefruit, pineapple, tomato, apple, and grape juices. These powders reconstitute readily even in cold water. The extremely low pressures necessary for freeze-drying are not required for this type of liquid-film or "puff" drying. Use of in-package desiccation to obtain extremely low moisture content, in combination with improved methods of flavor incorporation, has resulted in an orange powder which is quite stable even in storage at 100°F.

*PREPARATION AND PROPERTIES OF PHOSPHORIBOISOMERASE (abstract). B. Axelrod and R. Jang. Fed. Proc. 12(1), pt. I, 172-73, March 1953. Plant extracts have been fractionated to yield a highly active phosphoriboisomerase preparation having the ability to convert 2.7 millimoles of ribose-5-phosphate to the ketose per minute per milligram of protein nitrogen.

THE METABOLISM OF HEXOSE AND PENTOSE PHOSPHATES IN HIGHER PLANTS. B. Axelrod, R. S. Bandurski, C. M. Greiner, and R. Jang (with California Institute of Technology), Jour. Biol. Chem. 202(2):619-34, June, 1953. Evidence is presented showing the existence of an enzyme which oxidizes the triose phosphate as well as the existence of an enzyme system in higher plants which can convert glucose-6-phosphate and fructose-6-phosphate to phosphates of ribose, ribulose, heptulose, and triose, and pyruvic acid as well as effect the transformation of heptulose phosphate to glucose-6-phosphate and fructose-6-phosphate.

OPTICAL AND CRYSTALLOGRAPHIC PROPERTIES OF D-FRUCTOSE HEMIHYDRATE. F. T. Jones, F. E. Young, and D. R. Black, Analyt. Chem. 25(4):649, April 1953. Refractive indices, crystal morphology, and X-ray powder data are given for D-fructose hemihydrate.

CAROTENOIDS, APPLICATION OF COUNTERCURRENT DISTRIBUTION TO VALENCIA ORANGE JUICE CAROTENOIDS. A. L. Curl, Jour. Agr. and Food Chem. 1(6):456-60, June 1953. The fractionation of carotenoids by means of countercurrent distribution in a glass Craig apparatus has been studied. By use of two different solvent systems, a total of 6 fractions was obtained. Chromatography of the fractions for Valencia orange juice constituents resulted in identification of 8 compounds and tentative identification of 10 others.

*FROZEN FRUIT JUICE CONCENTRATES. E. G. Hellier, H. C. Weingartner, M.K. Veldhuis, G. E. Felton, and R. R. Legault. (The last-named author was employed at Western Regional Research Laboratory during preparation of this chapter.) Chapter 8, Refrigerating Data Book, Applications Volume, 1952, published by American Society of Refrigerating Engineers, New York City. Frozen concentrates of orange, grapefruit, tangerine, pineapple, and apple juices are discussed.

*PROCESS DEVELOPMENT STUDIES ON UTILIZATION OF FRUIT CANNERY WASTES. W.D. Ramage, Proc. Pacific Northwest Industrial Waste Conference (1952), Institute of Technology, State College of Washington, Pullman. A review of studies conducted by the Western Regional Research Laboratory on manufacture of feed molasses and dried pulp from pear cannery waste. This Proceedings also contains a report of studies at the Fruit and Vegetable Products Laboratory of this Bureau on use of edible pear cannery waste in the production of canning sirup, by C. L. Beardsley.

EFFECT OF DEGREE OF ESTERIFICATION ON VISCOSITY AND GELATION BEHAVIOR OF PECTIN. E. L. Pippen, T. H. Schultz, and H. S. Owens, Jour. Colloid Sci. 8(1):97 Feb. 1953. Pectin has been esterified with diazomethane so that degradation did not occur. The intrinsic viscosity was found to decrease with increasing degree of esterification. Maximum shear modulus of high-solids gels containing 0.3 percent pectin of nearly constant chain length was obtained near a degree of esterification of 40 percent. The significance of these findings to the theory of pectin gel formation is discussed.

PECTINATE AND PECTATE COATINGS. I. GENERAL REQUIREMENTS AND PROCEDURES. J. C. Miers, H. A. Swenson, T. H. Schultz, and H. S. Owens, Food Technol. 7(6):229-31, June 1953. The proposed method of coating consists of dipping or enrobing pieces of food first in a pectic solution, then in a solution of calcium chloride, and drying. A procedure for measuring strength of fresh coatings before drying is described and test data are reported.

PECTINATE AND PECTATE COATINGS. II. APPLICATION TO NUTS AND FRUIT PRODUCTS. H. A. Swenson, J. C. Miers, T. H. Schultz, and H. S. Owens, Food Technol. 7(6):232-35, June, 1953. A description of proposed processes for applying pectic coatings to shelled almonds, candied diced fruit, and soft dates is presented.

PROCESSING OF HEAT SENSITIVE FLUIDS. Patent No. 2,625,488, to T. Wasserman and M. E. Lazar, Jan. 13, 1953. Volatile flavoring essences are stripped from fruit juices by introducing the juice and steam into a steam-injection heater and then discharging the hot mixture into a second heater where the mixture is partially vaporized by contact with a heated surface. The resulting material is then released into a chamber to separate the vapor-containing volatile essences from the stripped juice. Use of total heating time of less than 2 seconds minimizes damage to the flavor of the products.

APPARATUS AND PROCESS FOR HEATING FLUIDS, PARTICULARLY FOODSTUFFS. Patent No. 2,636,430, to A. H. Brown, P. W. Kilpatrick, and M. E. Lazar, April 28, 1953. Invention concerns a steam injector heater wherein a liquid foodstuff and steam are intimately mixed so that foodstuff is brought to desired temperature in one second or less, thus to avoid flavor damage.

PROCESS OF COATING NUTS AND THE RESULTING PRODUCT. Patent No. 2,631,938, to J. C. Miers and H. S. Owens, March 17, 1953. Nut meats are coated with a calcium pectinate or pectate film containing as integral components salt and an antioxidant mixture (0.5 to 1 percent tert. butyl hydroxyanisole and sodium salt of ethylenediamine tetracetic acid). Since the salt is part of the film coating, its proportion remains constant despite handling of the product, in contrast with ordinary oiled and salted nuts. The antioxidants present in the film protect the nuts against rancidification so that products have a longer shelf life.

PHARMACOLOGY

EFFECTS OF PROLONGED INGESTION OF XYLOSE ON RATS. A. N. Booth, R. H. Wilson, and F. DeEds, Jour. Nutrition 49(2):347-55, Feb. 1953. Xylose was fed to rats at various levels up to 35 percent. A level of 15 percent or more was found to produce lens opacities. Because of this action, it is deemed inadvisable to risk incorporation of xylose in foods at any level for extended periods of time.

TOXICOLOGICAL AND PHARMACOLOGICAL STUDIES ON CHLORDANE. A. M. Ambrose, H. E. Christensen, D. J. Robbins, and L. J. Rather, Arch. Indus. Hygiene and Occupat. Med. 7(3):197-210, March 1953. A comprehensive study on the toxicity and pharmacology of chlordane by various routes of administration is presented. The routes were oral, cutaneous, and inhalation.

*EFFECT OF ITACOMIC ACID ON BODY WEIGHT AND GROWTH OF RATS (abstract), A.N. Booth, R. H. Wilson, and F. DeEds, Fed. Proc. 12(1):pt. I, 180, March 1953. Itaconic acid and its sodium salt, when mixed with the diet, inhibit growth in weanling rats, especially males. Itaconic acid, but not sodium itaconate, causes loss of weight in adult female rats, and does not markedly affect males. Suggestions on mode of action are made.

TOXICOLOGICAL AND PHARMACOLOGICAL STUDIES ON DIHYDROROTENONE. A. M. Ambrose, H. E. Christensen, and L. J. Rather, Jour. Amer. Pharm. Assoc. 42(6):364-66, June 1953. Data are given on acute and chronic toxicity of dihydrorotenone to rats. Single oral doses of 1.5 gm./kg. were nontoxic. Oral ingestion for approximately 400 days produced significant growth retardation of rats on diets containing 0.004 percent or more. On diets containing 0.004 through 0.032 percent a progressive loss of liver cell basophilia and dispersal of liver cell granules were observed. On the lower dietary levels, no significant histological changes were observed in the liver or other organs.

*PHARMACOLOGICAL OBSERVATIONS ON CHLORDANE. A. M. Ambrose, H. E. Christensen, and D. J. Robbins, Fed. Proc. 12(1):pt. I, 298, March 1953, (abstract). Continued oral ingestion, by the drug-diet method, by male and female rats in concentrations up to 20 and 80 ppm., respectively, for 400 days caused no symptomatic or anatomic reactions. Higher dietary levels were found to produce proportional microscopic changes. Appreciable storage of chlordane was found in the perirenal fat of rats with a prompt drop in storage upon withdrawal of chlordane from the diet.

POULTRY PRODUCTS

QUALITY AND STABILITY OF TURKEYS AS A FUNCTION OF DIETARY FAT. A. A. Klose, H. L. Hanson, E. P. Mecchi, J. H. Anderson, I. V. Streeter, and H. Lineweaver, Poultry Sci. 32(1):82-88, Jan. 1953. Frozen storage stability of turkeys produced on diets varying in type of fat were determined by both chemical and organoleptic analyses. Quality after storage was related to the fatty acid composition of the dietary fat and that of the carcass fat, and also to the induction period of raw fat. Significant differences in quality can result from differences in type of dietary fat present at a level as low as 2 percent of the total diet. However, important adverse effects are produced only by the highly unsaturated fats such as fish oil or linseed oil.

*OVOMUCIN AND THE ANTIHEMAGGLUTININ ACTIVITY OF EGG WHITE (abstract). L.R. MacDonnell, C. A. Knight, and R. E. Feeney (with University of California). Fed. Proc. 12(1):pt. I, 241, March 1953. Ovomucin, an egg white mucoprotein, was found to be closely associated with the virus antihemagglutinin (AH) activity in egg white and is responsible for the gel-like characteristics of thick egg white. Thick egg white contained approximately 4 times as much concentration of AH activity and ovomucin as thin. Paradoxically, chemical reduction of ovomucin solutions, which greatly decreased viscosity, was without effect on AH activity. Ovomucin in 0.5-1 percent solution showed no AH activity loss under conditions which usually denature proteins. The activity of partially purified preparations is therefore unusually stable, especially so if it resides in a protein component.

*COPPER INACTIVATION OF LYSOZYME (abstract), R. E. Feeney, L.R. MacDonnell, and E. D. Ducay, Fed. Proc. 12(1):pt. I, 201-202, March 1953. Copper ions rapidly inactivated lysozyme in weakly alkaline solutions (pH 9.0-9.5) in the presence or absence of O_2. Approximately 2 Cu atoms are required per molecule of lysozyme. The Cu-inactivated product resembled denatured protein in its physical and chemical properties. Copper also inactivated the egg white protein, ovomucoid.

SUBSCALDING VS. SEMISCALDING OF TURKEY. H. Lineweaver and A. A. Klose, Ice and Refrigeration 124 (6):31, June 1953. A reprint of an article in Turkey World (see previous list, AIC-321, Supp. 3, page 7).

WASTE FEATHERS CONVERTED TO FERTILIZER. G. H. Brother, Research Achievement Sheet 161(C), 2 pages, Agr. Research Admin., U. S. Dept. Agr., April 1953. A summary of achievement in research, with selected references and estimate of costs.

VETETABLES

AIC-356, PRELIMINARY PLANNING FOR VEGETABLE DEHYDRATION. C. L. Rasmussen and W. L. Shaw, June, 1953, mimeographed. Introduces dehydration to a newcomer and comprises a fairly complete introductory discussion of factors he must face in considering whether or not to attempt entry into that field. Sources of information are suggested in the text, and selected literature references are included. Topics discussed include a consideration of who buys the products, how dehydration is accomplished, what raw material can be used and where plant is to be located, and a review of labor, management, utility, waste disposal, equipment, and capital requirements.

COMPARISON OF METHODS FOR MEASURING THE MATURITY FACTOR IN FROZEN PEAS. R. U. Makower, M. M. Boggs, H. K. Burr, and H. S. Olcott, Food Technol. 7(1):43-48, Jan. 1953. Comparisons were made of the maturities of 68 samples of frozen peas as measured by various physical and chemical tests and as rated by panels of trained human judges. The samples represented four varieties, three seasons, and several harvest dates and size classes.

FRACTIONATION OF STARCHES FROM SMOOTH AND WRINKLED SEEDED PEAS. MOLECULAR WEIGHTS, END-GROUP ASSAYS, AND IODINE AFFINITIES OF THE FRACTIONS. A. L. Potter, V. Silveira, R. M. McCready, and H. S. Owens, Jour. Amer. Chem. Soc. 75(6):1335-38, March, 1953. The amylose and amylopectin of smooth-seeded Alaska and wrinkled-seeded Perfection peas have been studied. The studies have shown that starch from Alaska peas is similar to cereal and root starches, while starch from Perfection peas is different. A spot test for detecting amylose in starch solution was developed and applied to the amylopectin fractions.

EFFECTS OF PROCESSING VARIABLES ON LEACHING LOSS, CAROTENE CONTENT AND SUSCEPTIBILITY TO BROWNING IN DEHYDRATED CARROT. C. E. Hendel, R. R. Legault, and W. F. Talburt, Food Technol. 7(4):60-62, April 1953. Effects of blanching time, of spray with sulfite solution or with water, and of heat damage at the end of the drying cycle have been studied. Leaching losses of 5 to 12 percent of product weight were caused by the spray with water or sulfite solution. Leaching reduced rate of browning during subsequent storage of dried product. Heat damage during drying increased somewhat rate of browning during storage. Carotene content remained substantially constant during processing.

REACTION BETWEEN 2,6-DI-T-BUTYL-p-CRESOL AND BROMINE. G. M. Coppinger and T. W. Campbell, Jour. Amer. Chem. Soc. 75(3):734-36, Feb. 1953. The reaction between 2,6-di-t-butyl-p-cresol and bromine has been examined in methyl alcohol and t-butyl alcohol. The products observed were 2,6-di-t-butyl-4-merhyl-4-methoxy-2,5-cyclohexadienone and 3,5-d-t-butyl-4-hydroxybenzaldehyde, respectively. A possible mechanism of the reaction is proposed.

RECENT ADVANCES IN POTATO GRANULE TECHNOLOGY. R. L. Olson, W.O. Harrington, G. H. Neel, M. W. Cole, and W. R. Mullins, Food Technol. 7(4):177-81, April 1953. Potato granules are produced commercially by the add-back process. In this method a portion of dried product is recycled by addition to freshly cooked, mashed potatoes, producing a moist granular mixture that is subsequently dehydrated as a powder. In experiments recently conducted, such processing factors as moisture content of granular mixture, time allowed for moisture equilibration, and drying temperature have been observed to exercise a material effect on product quality.

BACILLUS MEGATERIUM FOR BIOSYNTHESIS OF COBALAMIN. J. A. Garibaldi, K. Ijichi, N. S. Snell, and J. C. Lewis, Indus. and Engin. Chem. 45(4):838-46, April 1953. The biosynthesis of cobalamin (vitamin B_{12} complex) can be completed within 6 hours, with a yield of approximately 50 g. of dried B. megaterium cells per 100 g. of sucrose. The cobalamin is associated with the cells, which can be recovered by means of a yeast centrifuge and drum-dried to give a pale-tan, palatable, free-flowing product containing 15 mg. of cobalamin per kilogram.

DEHYDRATION OF SWEETPOTATOES. H. K. Burr. Activities Report (Quartermaster Food and Container Institute) 5(1):25-26, 1953. Issued as a section of report of conference on fruit and vegetable dehydration. A brief review of preliminary studies.

A NEW SULFUR-CONTAINING AMINO ACID FROM SUBTILIN. G. Alderton, Jour. Amer. Chem. Soc. 75(10):2391-92, May 1953. The isolation and some properties of a new naturally occurring thioether amino acid from the antibiotic peptide subtilin are described. The structure has been proposed as one of the alpha-amino-beta-(2-amino-2-carboxyethylmercapto)-butyric acids. The configurations at the two alpha carbon atoms have been determined.

EFFECT OF SOME ANTIBIOTICS ON CLOSTRIDIUM BOTULINUM. A. A. Andersen, H.D. Michener and H. S. Olcott, Antibiotics and Chemotherapy 3(5):521-26, May 1953. The activity of a number of antibiotic preparations was determined against Cl. botulinum 62A. Penicillin and terramycin were active at 0.2 ppm.; subtilin at 1 ppm.; chloromycetin, methylol gramicidin, and a crude preparation of cinnamycin and a second active component at 5 ppm.; and aureomycin, laterosporin, cinnamycin, actinomycin, thiolutin, and nisin at 20 ppm.

* ANTIBIOTICS IN FOOD PRESERVATION. I. THE INFLUENCE OF SUBTILIN ON THE THERMAL RESISTANCE OF SPORES OF CLOSTRIDIUM BOTULINUM AND THE PUTREFACTIVE ANAEROBE 3679. F. R. LeBlanc, K. A. Devlin, and C. R. Stumbo (contract publication) (State College of Washington, Pullman), Food Technol. 7(4): 181-84, April 1953. The study was designed to determine whether or not subtilin in low concentrations in a food decreases the resistance of spores of two food spoilage bacteria. Temperatures used were those commonly used for low-acid foods. Results indicate that spores of the two bacteria are appreciably less resistant to heat when suspended in a food containing small amounts of subtilin.

NUTRITIONAL STUDIES WITH LACTOBACILLUS FERMENTI. N. Snell and J. C. Lewis, Jour. Bact. 65(6):671-766, June, 1953. Asparagus juice concentrate and certain other plant products have been observed to be highly stimulatory to Lactobacillus fermenti 36 in the presence of an optimal concentration of of thiamine, under the general conditions recommended for the assay of thiamine. More detailed study has shown that growth approximating that induced by asparagus juice concentrate may be obtained on a medium containing an approximate combination of fructose, maltose, and reducing agents.

*UNUSUAL ASPECTS AND NOVEL USES OF ANTIBIOTICS. J. C. Lewis, Proc. 14th Annual Biology Colloquium, Oregon State College Press, 1953. A gereral review of the field of recent researches on antibiotics, limited chiefly to nonmedical uses.

*PRINCIPLES AND PROCEDURES IN THE ISOLATION OF ENZYMES. S. Schwimmer and A. B. Pardee (with University of California), Advances in Enzymology, Vol. 14, pp. 375-409, 1953. This monograph outlines principles and techniques for the isolation of enzymes. The main objective has been to present in systematic order the multitude of procedures which have led to successful enzyme purification, and to mention some of the more promising new methods which have recently appeared in the literature.

*ENZYMATIC ACTIVITIES IN A MICROBIAL PREPARATION OF GLUCOSE OXIDASE (abstract), S. Schwimmer, Fed. Proc. 12(1):266, Pt. I, March 1953. Commercial preparations of glucose oxidase were used in an unsuccessful attempt to decrease reducing sugars in dried potato. The failure was due to the presence of invertase amylase, phosphorylase, and glucose-6-phosphatase.

PRODUCTION OF HEXAHYDROLUPULONE AND THE SALTS THEREOF. Patent No. 2,640,856, to J. F. Carson, June 2, 1953. Lupulon, a natural constituent of hops, is reacted with hydrogen in the presence of platinum oxide or palladium to produce hexahydrolupulon which exhibits greater antibiotic activity and increased stability as compared with lupulon.

FROZEN PEAS IMPROVED BY RESEARCH. H. S. Olcott, Research Achievement Sheet 159(C), 2 pages, Agr. Research Admin., U. S. Dept. of Agr., March, 1953. A summary of achievement in research, with selected references and estimate of costs.

WOOL

DIELECTRIC DISPERSION OF POLAR POLYMERS AT MICROWAVE FREQUENCIES. T. M. Shaw and J. J. Windle, American Physical Society Bulletin 28(2):20, March 26, 1953. Reports further results on dielectric properties of wool at 3,000 and 10,000 megacycles, obtained with improvements in the cavity resonator used in the measurements.

WOOL SCOURING PROCESS. Patent No. 2,629,723, to H. P. Lundgren, W. Fong, and A. S. Yeiser, Feb. 24, 1953. Raw wool is scoured with an aqueous liquor containing an emulsification agent (soap, detergent, or wool suint) and an oxygenated organic compound (methanol, ethanol, butanol, acetone, etc.). The spent scouring liquor is treated with additional oxygenated organic compound to precipitate wool grease and after distillation of excess oxygenated organic compound, the liquor can be recycled for extraction of further quantities of raw wool.

RUBBER

Publications listed below originated from the Natural Rubber Extraction and Processing Investigations Laboratory at the U. S. Natural Rubber Research Station, Salinas, Calif. The work of this unit was discontinued on April 30, 1953. For earlier publications see AIC-321, Supplements 2 and 3.

MOONEY VISCOSITY MEASUREMENTS OF TECHNICALLY CLASSIFIED RUBBERS. R. H. Taylor and A. G. Veith, Amer. Soc. Test. Materials, Special Tech. Bul. 136, pp. 19-29, 1952. Reviews the methods of adjusting and operating the machine. Effects of such things as die closure, calibration, temperature, dimension of parts, and sample preparation are discussed.

DIFFUSION PHENOMENA IN THE SOLVENT DERESINATION OF GUAYULE RUBBER. T. F. Banigan, Jr., Indus. and Engin. Chem. 45(3):577-81, March 1953. Solvent extractions, conducted on a laboratory scale with thin sheets of guayule rubber, gave rate data which in several cases can be represented by a diffusion equation based on Fick's law. Diffusion coefficients for ethyl alcohol, acetone, and methyl ethyl ketone were found to be in the following ratios, respectively: 0.07, 1.0, and 2.5. The results attest to the practical advantages to be gained by deresinating guayule rubber in the form of "worms."

DIFFERENTIAL MIGRATION OF RUBBER BY REVERSED-PHASE PARTITION CHROMATOGRAPHY. T. F. Banigan, Jr., Science 117(3036):249-50, March 1953. Discloses a procedure whereby natural and synthetic rubbers, and possibly other high polymers, can be chromatographed on treated filter paper to give patterns characteristic of their migration tendencies.

HIGH-QUALITY RUBBER BY ACETONE DERESINATION OF GUAYULE. F. E. Clark, T. F. Banigan, Jr., J. W. Meeks, and I. C. Feustel, Indus. and Engin. Chem. 45 (3):572-76, March 1953. Laboratory and pilot plant experiments have demonstrated that a low-resin-content guayule rubber, equal in quality to Hevea, can be prepared by acetone deresination of wet "worms". Guayule in this favorable physical form, which results when guayule shrub is pebble-milled, can be rapidly and thoroughly deresinated to a tough, high viscosity rubber suitable for carcass stock in heavy-duty truck tires. Results reported are intended to provide background for development of a large-scale continuous extractor.

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NITROGENOUS CONSTITUENTS IN CITRUS FRUITS. I. SOME FREE AMINO ACIDS IN CITRUS JUICES DETERMINED BY SMALL-SCALE FILTER-PAPER CHROMATORGAPHY. J.C. Underwood and L. B. Rockland, Food Res. 18(1):17-29, Jan.-Feb. 1953. Small-scale filter-paper chromatography procedures have been applied to the determination of the nitrogenous constituents in the filtered juices of orange, tangerine, grapefruit, lemon, lime, kara, kinnow, honey, and a lemon-orange hybrid. The character and quantities of the free amino acids and related compounds in the juice of most of the citrus fruits appear to be characteristic of the variety and independent of the geographical origin of the fruit.

CITRUS FLAVORING, VOLATILE WATER-SOLUBLE CONSTITUENTS OF GRAPEFRUIT JUICE. J. G. Kirchner, J. M. Miller, P. G. Rice, G. J. Keller, and M. M. Fox, Jour. Agr. and Food Chem. 1(7):510-12, June 1953. Changes in the water-soluble volatile flavoring constituents of grapefruit juice that take place during canning and long storage of canned juice have been studied. Volatile acids, methyl alcohol, and furfural increase considerably during storage.

CITRUS FLAVORING, VOLATILE OIL CONSTITUENTS OF GRAPEFRUIT JUICE. J. G. Kirchner and J. M. Miller, Jour. Agr. and Food Chem. 1(7):512-18, June, 1953. The oil constituents of the volatile flavoring material of freshly canned and stored grapefruit juice have been isolated. These oils have been separated into 21 compounds and 3 complex fractions. Changes in stored juice were the same as those in freshly canned, but greater quantitatively.

FROZEN PUREES FROM CITRUS FRUITS. E. A. Beavens. Research Achievement Sheet 158(C), 2 pages, Agr. Research Admin., U. S. Dept. of Agr., March, 1953. A summary of achievement in research, with selected references and estimate of costs.